

## ABNORMAL SHELLS

BY L. E. DANIELS

In the United States as elsewhere shells are frequently met with that are abnormal to a greater or less degree due to the shell having met with an injury during its growth.

Tryon, in the American Journal of Conchology, Vol. 2, plate 1, fig. 4, figures an abnormal specimen of *Planorbis bicarinatus* Say, from the collection of Charles M. Wheatley Esq., of Phoenixville, Pa., collected by him at Mexico, Oswego Co., N. Y. He says "this is the first American specimen which we have observed to deviate much from the normal form; reversed or scalariform shells being very much rarer in America than in Europe. Some of our species of *Lymnæa* are sometimes slightly scalariform, and in the *Viviparidæ* this is more frequent, but the deviation has never been observed to be very great. *Melantho integra* and *decisa* are both occasionally met with, reversed. I believe that no scalariform *Helix* has been observed in the United States, and the reversed specimens known do not exceed ten or twelve."

Thomas Bland in "Remarks on Certain Species of North American Helicidæ Part 3," 1862, says. "In one of my specimens of *H. tridentata*, after completion of the shell, the animal continued the last whorl about 2 mill beyond the lip, partially reflected the new lip, and added two incipient teeth in advance of the old ones. On plate 4, fig. 20 a sketch is given of the very singular reparation of one of my specimens of *H. septemvolva*. The fracture was behind the aperture, which the animal in consequence abandoned, but it formed a new one by reflecting the outer lip, on the lower part of which it added a small tooth,—it found insufficient space for another partial tooth behind the old aperture."

Binney in the Manual of American Land Shells, page 282, fig. 300, figures an abnormal specimen of *Stenotrema monodon*. The peristome having been broken after the animal's arrival at maturity, a new peristome has been formed somewhat in the rear of the first, and a new parietal tooth added. On page 291 he figures *P. tridentata* with a double peristome.

S. C. Wheat in Bulletin of the Brooklyn Conchological Club figures a specimen of *Pyramidula alternata* Say (fig. 5) found near

Ithaca, N. Y. It is terraced, the suture being placed far below the carina of the preceding whorl. The carina is unusually sharp. Another specimen (fig. 4) was flat, the suture being above the carina and deeply impressed. He also figures an abnormal *P. thyroides* and *P. tridentata*.

H. A. Pilsbry in Mollusca of the Southwestern States I, page 274, say: "Scalariform monsters are not rare, but the inception of that abnormal condition seems to be invariably traceable to an injury of the shells." He figures on plate XXIV fig. 32 a scalariform specimen of *Oreohelix strigosa concentrata* (Dall).

Through the kindness of the Editors of "The Nautilus" I am enabled to present to its readers the following descriptions and figures of abnormal specimens in my cabinet.

*Sonorella coloradoensis* (Stearns).

East side of Powell's Plateau near Mojave Creek, Grand Canyon, Arizona, 1909.

The shell is scalariform, due no doubt to an injury when young.

*Polygyra cereolus* (Mühlf). Pl. V, figs. 1, 2, 3.

Long Boat Key. Tampa Bay, Fla., 1900.

One specimen (fig. 1) is normal up to the end of the eighth whorl. A break then occurred, after which the whorl deviates downward, is abruptly recurved, traversing the base across the umbilical region. A nearly normal aperture is formed. In another shell, fig. 2, the whorl adjacent to the aperture dips down for a short distance, subsequently rising above the level of the spire. A well-formed normal example is shown in fig. 3.

*Polygyra tridentata* (Say.) Pl. V, figs. 10, 11.

Wyandotte, Crawford Co., Ind., 1903.

This shell had been broken back of the peristome, the animal instead of repairing the break retreated eight mm., and formed a new peristome and parietal tooth.

I succeeded in extracting the animal without breaking the outer peristome although the attachment to the shell was very slight, this (the outer) peristome being dead.

*Polygyra inflecta* (Say.) Pl. V, fig. 6.

Jeffersonville, Clark Co., Ind., 1903.

Peristome malformed, the callus wanting above, teeth rudimentary.

*Polygyra profunda* (Say). Pl. V, fig. 12.

Near Hoge's Bridge, Morris, Ills., 1910. This shell had formed a peristome, then carried the shell forward twelve mm. and formed a second peristome. The shell between the two peristomes is white, has no epidermis, and has a rough appearance.

*Polygyra albolabris* (Say). Pl. V, fig. 13.

North Vernon, Jennings Co. Ind., 1903. In one specimen the last two-thirds of the body-whorl has been injured, resulting in a linear furrow running parallel with the suture. Another shell (fig. 13) was injured before forming the peristome which has two projecting points. The umbilicus is partly open.

*Polygyra exoleta* (Binn). Pl. V, fig. 14.

Mitchell, Ind., 1901. Peristome malformed, bisinuate.

*Polygyra elevata* (Say). Pl. V, fig. 15.

Mitchell, Ind., 1901. This specimen appears to have attained its growth, and apparently had partially formed the peristome, for at the proper place a parietal tooth was formed which is about one-half grown. The last half of the body-whorl was then broken off and a new peristome and parietal tooth were formed.

*Polygyra hirsuta* (Say). Pl. V, fig. 7.

Bass Lake, Starke Co., Ind., 1902.

Aperture malformed exactly as in the specimen of *elevata* described above, the last part of the whorl having been broken off after the parietal tooth was half formed, and a new peristome and tooth were developed a fourth of a whorl behind the original aperture.

*Polygyra fraterna* (Say). Pl. V, fig. 5.

Brookville, Ind., 1903.

This shell had formed a peristome and parietal tooth, then carried the shell forward five mm. and formed another peristome and parietal tooth, the last aperture being small. The original parietal tooth remains standing deep within. This shell belongs to the same class of monster described above for *P. profunda*. It is unlike most abnormal shells which are due to breakages, for here a second period of growth is superposed upon a normally formed and completed shell.

*Holospira bilamellata* Dall. Pl. V, figs. 8, 9.

Hacheta Grande Mts., New Mex., 1910.

This shell was normal up to the penultimate whorl, when without any apparent injury it contracts suddenly to three-fifths the former diameter. The last whorl enlarges again somewhat, and is nearly normal. A normal example is figured for comparison, fig. 9.

*Holospira* n. sp.

Dragoon Mts., Arizona, 1910.

A strongly ribbed new species which will shortly be described by Messrs. Pilsbry and Ferriss. The shell was broken at the end of the eighth whorl. The next  $2\frac{1}{2}$  whorls are ribless; ribs then begin again irregularly, finally becoming normal on the last whorl.

*Oreohelix strigosa depressa* (Ckll) Pl. V, fig. 16.

Jacob's Canyon, Kaibab Mts., Ariz., 1910.

A scalariform specimen, the last whorl free in front. There are no signs of this shell ever having been injured in the least. Normal shells are shown in figs. 18, 19.

A reversed specimen from Powell Plateau, Grand Canyon, Ariz., 1909 is shown in fig. 17. J. H. Ferriss of Joliet, Ills., has a similar one.

*Planorbis bicarinatus* Say. Pl. V, fig. 4.

Lily Lake, La Porte, Ind., 1909.

This extraordinary specimen has the general shape of *Viviparus intertextus* with a small umbilicus and a deeply channeled suture. The aperture is oval with expanded peristome. So abnormal in shape is this specimen that it takes some study to see the common *Planorbis bicarinatus* in it.

*Campeloma decisum* (Say).

Pine Lake, La Porte, Ind., 1906.

While reversed specimens of *Campeloma* are not rare the novelty of this one is that it contained three young, all of which are reversed.

NOTE BY THE EDITOR.—Little has been published upon abnormal shells in this country, though there must be abundant material scattered among collections. The notes given above afford suggestions for a classification of teratologic shells into several classes as follows :

1. Shells in which growth has been resumed after the completion of a normal peristome, figures 5 and 12.

2. Shells in which broken parts have been repaired or restored.
  - 2a. Broken peristome repaired, figs. 13, 14.
  - 2b. A new peristome developed behind the original one after breakage, figs. 7, 10, 15.
3. Shells coiling abnormally.
  - 3a. Shell sinistral, fig. 17.
  - 3b. Shell scalariform, figs. 4, 16.
  - 3c. Shell irregularly coiled, figs. 1, 2, 8.

Part of these cases are always due to breakage; others, such as no. 1 and 3a to more obscure constitutional conditions. Scalariform shells may be due to several causes. The subject is of some importance from an evolutionary standpoint because the modifications denoted by classes 1, 3a, 3b and 4c have in some cases become actually characteristic of species or genera.

Collectors having material enlarging our knowledge of the subject as illustrated by Mr. Daniels are invited to make it known.

Figures 1 to 9 of plate V are about double the natural size.

---

#### NEW CUBAN LAND SHELLS: I. ANNULARIA AND CHONDROPOMA.

---

BY H. A. PILSBRY AND JOHN B. HENDERSON, JR.

---

The following species will be illustrated in connection with the second paper of this series.

##### ANNULARIA RAMSDENI n. sp.

The shell is openly umbilicate, wider than high with conic spire. Last whorl brownish-corneous or whitish, the spire light red, whorls  $4\frac{1}{2}$ , strongly convex, the last tubular. Suture narrowly channeled, the axial threads forming little points where they pass over the raised edge of the channel. Sculpture of closely crowded lamina-like axial threads, their intervals having one or two smaller threads. There are a few low spiral cords within the umbilicus and a stronger one near its opening. The first  $1\frac{3}{4}$  whorls are smooth and well raised. Aperture oblique, circular, pale red within the lip. Peristome expanded, duplicated by a thin outer lamina on the columellar and upper sides, dilated in a forwardly concave lobe above, which is appressed to the preceding whorl.